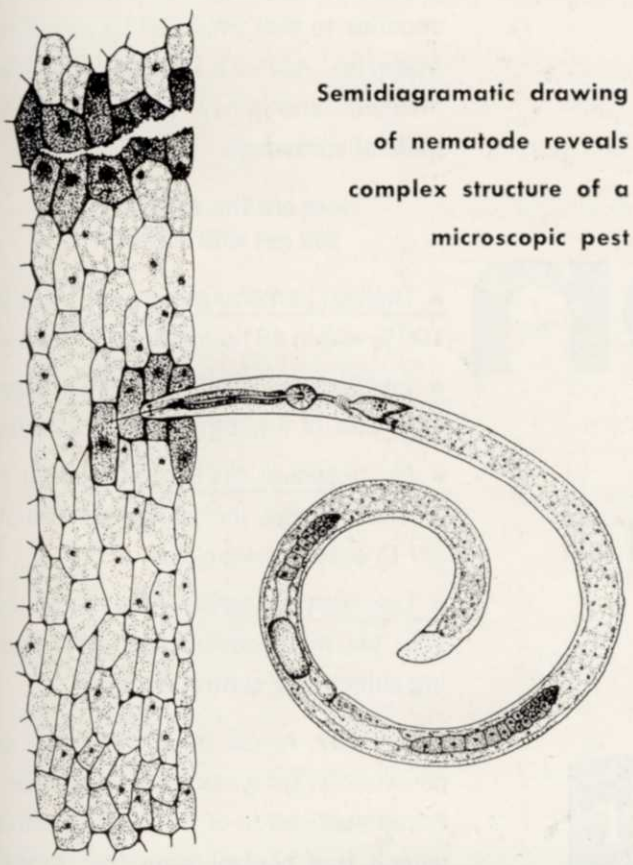
WEEDS and TURF

FEBRUARY
1964

The grass-roots magazine of vegetation management



Semidiagramatic drawing of nematode reveals complex structure of a microscopic pest

Update On Nematode Control

page 10

Northeast Weed Group Is PR Minded 18

Eye New Bermudagrass Disease in Ark 22

Using Scuba Diving Outfits In Aquatic Weed Jobs ... 16

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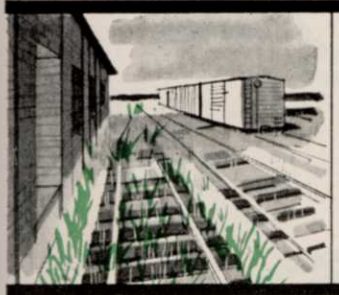

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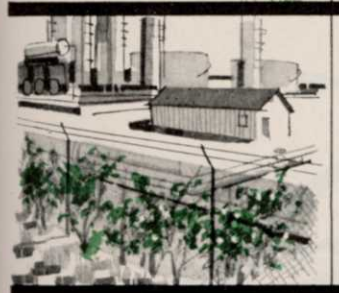

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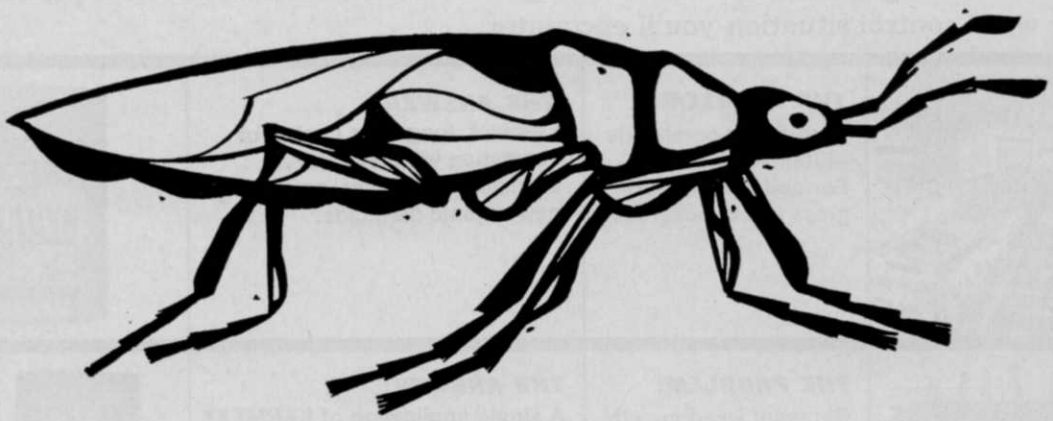

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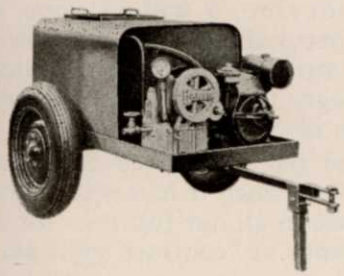

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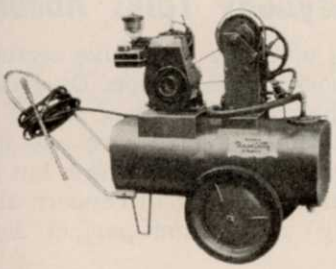

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WEEDS and TURF

February 1964 **Volume 3, No. 2**

Features:

What Turf Managers Need to Know About Nematodes 10

How We Use Scuba Divers in Aquatic Weed Control By Henry Carsner and Ralph Grenfell 16

"The Public Must Be Told" Weedmen Decide At 18th Northeastern Weed Control Conference 18

Turf Weeds and Pesticide Tests Top Off Wisconsin Co-op Conference Jan. 8-9 22

Strange Bermudagrass Disease Being Researched at U. of Arkansas 22

Departments:

Editorials 6

W & T Mailbox 8

Know Your Species: St. Johnswort 24

Meeting Dates 28

Advertisers Index 28

Classifieds 28

Trimmings 30

WEEDS AND TURF is the national monthly magazine of urban/industrial vegetation management, including turf maintenance, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

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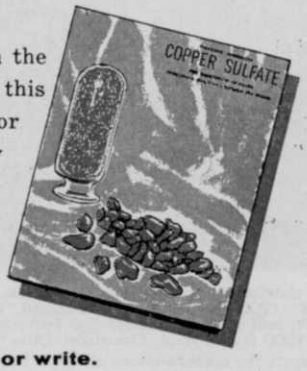

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TENNESSEE CORPORATION
521 Grant Building, Atlanta 3, Georgia

Battle Royal

ELSEWHERE in this issue is a news story which reveals the acquisition, by U. S. Borax & Chemical Corp., of the Reade Manufacturing interests.

USB spokesmen say the move will enable the giant firm to offer coast-to-coast contractual weed control for railways, and will also permit the more thorough marketing of weed control chemicals.

What this means for the local weed controller is obvious. More and more industrial complexes, taking note of the dynamic growth of urban/industrial vegetation management, are reexamining their sales policies, and at least half a dozen *major* chemical manufacturers are in a position to offer contract applications.

This is as it should be. Nevertheless, it means a battle royal for the local operator, who must now pit his energies and his wits against the smooth and powerful mechanics of corporate organization.

Personalized service, a will to serve, and knowledge of local peculiarities are just a few advantages the small firm has to offer. Of course, there are disadvantages too, but we feel there's a place for both kinds of operations.

We are convinced the USB move augers well for the entire industry, since it is a profound expression of confidence in all our futures. We welcome them to the ranks of "contract applicators."

Everybody Talks About It

We were talking with the executive secretary of the National Arborists Association, Dr. Paul E. Tilford, recently when the subject of safety records came up. Not that arborists are any more guilty than some other types of readers; but it is true that the industry shows great concern about what is apparently a less-than-perfect safety record.

Safety is like the weather, anyway, but in this case it *does* help when everybody talks about it: in fact, that's one way to get better results in safety programs.

Company managers must constantly be thinking about safety records, and this concern should be expressed in frequently held staff meetings so foremen and crew supervisors will know their superiors are worried about the wasted time, and needless pain, of accidents which could have been avoided.

Every company president knows that lost-time accidents are translated into lost profits; then the loss ratio is compounded by increased insurance and state compensation rates. This is a simple, obvious, undeniable fact.

Yet accidents persist.

We recommend that managers and workmen alike take a close look at how they do their jobs this year, and so end the needless waste of on-job accidents.

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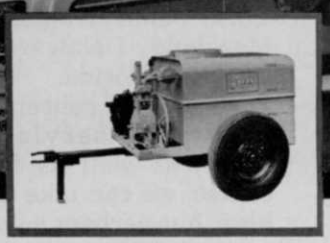

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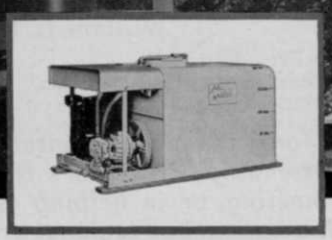

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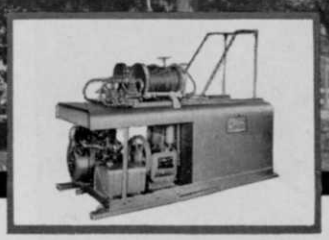

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Wants National Group

As a note of general interest to your subscribers, our organization (Pesticide Sprayers Association Inc. of Portland, Ore.) is a very active association which meets monthly on the first Monday. Our chief aim is to educate ourselves and the public in the safe, effective use of pesticides. We have our own county agent on our board of officers and keep a full slate of top experts on our meeting agenda as speakers and sources of advice.

Last fall we met with the Seattle group (Washington Ground Sprayers) and plan to host a Northwest Regional Meeting here in Portland next September. More information on that later. We have previously discussed a regional and even a national association as things to point toward in the future. These are developments which must come for the good of the industry.

Your publication is read with much interest here.

William L. Owen

Vice President
Pesticide Sprayers Assn. Inc.
Portland, Oregon

If any readers are interested in attending Mr. Owen's regional meeting, or in helping establish a national or regional group, we suggest writing him at 8520 S.E. Hood, Clackamas, Oregon. Ed.

Aquatic Reprints?

I would like to receive the first two articles of the series of three dealing with aquatic weed control. We are at present a subscriber to *Weeds and Turf* but were not when the first two installments of the series were published.

Robert M. Stern, Ph. D.

Director of Research
Great Lakes Biochemical Co., Inc.
Milwaukee, Wis.

This letter from a midwestern aquatic weed control company is typical of scores of inquiries we've received about our series on aquatic weed control. Indeed the response has been so gratifying that we intend to make the entire series available as a single reprint sometime in the early part of the year. Availability and price for the reprint will be announced in W&T as soon as possible. Ed.

Where to Buy Thatch-O-Matic

Your September issue contains an article on de-thatching (Business Opportunities in Turf Reseeding, p. W-17) which has possibilities. Please tell us where we can get further information on the Thatch-O-Matic.

Walter Rhoads

Gold Coast Power Spraying
Pompano Beach, Fla.

The Thatch-O-Matic is manufactured by the Parker Sweeper Co., 91-99 N. Bechtle Ave., Springfield, Ohio. The firm will be happy to furnish further details to anyone who writes. Ed.

Sales Leads . . .

Please advise if you have information on firms which offer industrial weed control services in the following states: New York, Pennsylvania, Michigan, Maryland, Delaware, New Jersey, and Florida.

We have a concern that is interested in service in these states, as well as in Ohio. Of course, we can take care of them here, but perhaps some other operators will want the contract in the above states.

L. A. Smith

President
Azo Chemical Co.
715 Ninth St. N.E.
Canton, Ohio 44704

Of course subscribers to WEEDS AND TURF magazine include thousands of contract application firms, and probably all these with offices in the above states would like some more business. However we do not feel it proper for us to single out one such firm over another, so we're printing Mr. Smith's letter in hopes interested CAs will write to him directly. Ed

Weeds and Turf welcomes expressions of opinions from its readers. Send ideas and comments briefly as possible to Charles D. Webb, Editor, Weeds and Turf, 1900 Euclid Ave., Cleveland, Ohio, 44115.

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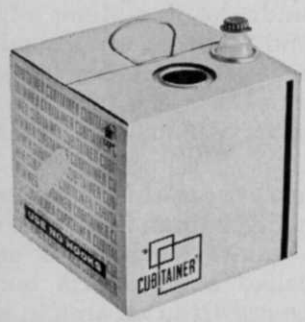

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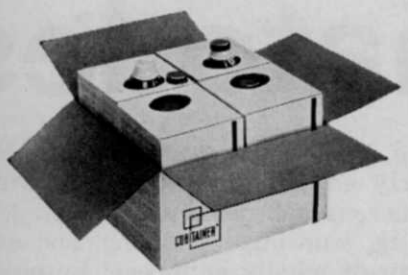

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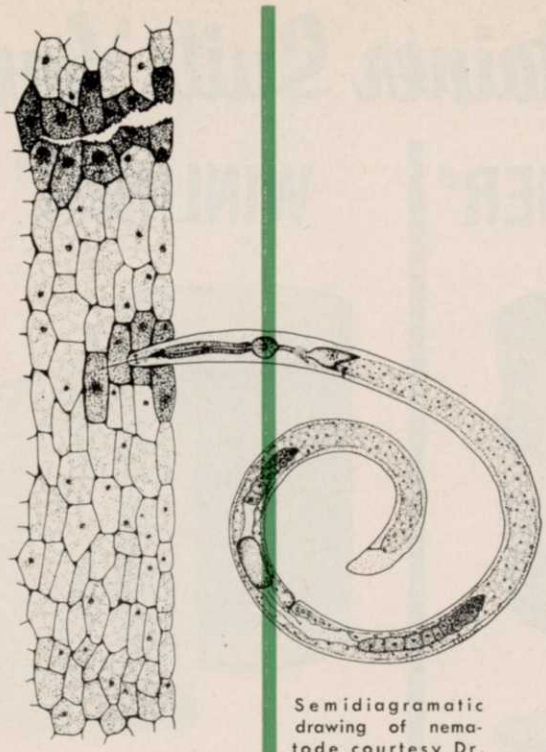


Semidiagramatic drawing of nematode courtesy Dr. Houston B. Couch (Pennsylvania State University) author of **Diseases of Turfgrasses.**

What Turf Managers Need to Know About Nematodes

Results of another **Weeds and Turf** field research project.

AWARENESS of nematode damage in turf has been steadily increasing. It is evident that homeowners and others concerned with decorative and useful grasses are going to call upon contract applicators for nematode control service as the demand for fine turf increases. To meet this anticipated demand, CAs will have to assimilate increasing amounts of diversified control information, both biological and chemical.

A quick examination of the nematode's place in the scheme of nature will help orient the reader to the subject of nematodes. These animals have such unusual characteristics that some experts have placed them in a grouping by themselves. Since no close relatives of nematodes can be found, they are placed in Phylum Nemata. *Phylum* is a primary grouping of plants and animals with similar characteristics, assumed to have descended from a common ancestor. For example, those animals with jointed legs and external skeletons (insects, spiders, crustacea) are placed in the Phylum Arthropoda.

Nematodes are suspected to be the most numerous form of animal life on earth. One acre is estimated to hold hundreds of millions of individuals. It has been said that they are second only to arthropods in the destruction they cause. A major importance stems from the fact that they are, as a group, parasites of man and animals in addition to plants.

Nematodes are causal organisms for "creeping eruption," a skin ailment familiar to termite operators. The eruption results when a cat or dog parasitic nematode called a hookworm burrows into a human, while he crawls in an area in which pets loaf. Certain nematode species also cause elephantiasis, entering man through a bite of an infected mosquito. Trichinosis in man is caused by eating improperly cooked pork infected with nematodes. Numerous self-descriptive plant ills (root-knot, wilting, stunting, yellowing, and decline) may be caused wholly or in part by plant parasitic nematode feeding. In this discussion, we will focus on those which parasitize or otherwise affect plants, specifically turfgrasses.

Plant parasitic nematodes have slender, unsegmented, translucent, colorless, legless, wormlike bodies which move in a whiplike fashion. Some mature female sedentary parasites, such as the root-knot nematode, and cyst-forming nematodes, lose their slender form and become lemon-shaped, pear-shaped or sometimes almost spherical. In general, adult plant parasitic nematodes measure 1/60 to 1/16 inch long. The nematode body is equipped with longitudinal muscles, a nervous system, a digestive system, and reproductive sys-

tem. They lack respiratory and circulatory systems.

The eyeless head portion of plant parasitic nematodes carries a specialized hollow stylet, similar to a hypodermic needle, through which nematodes inject digestive fluids into individual plant cells before they suck out the cell contents. Nematodes lacking stylets cannot injure plants and are called nonparasites.

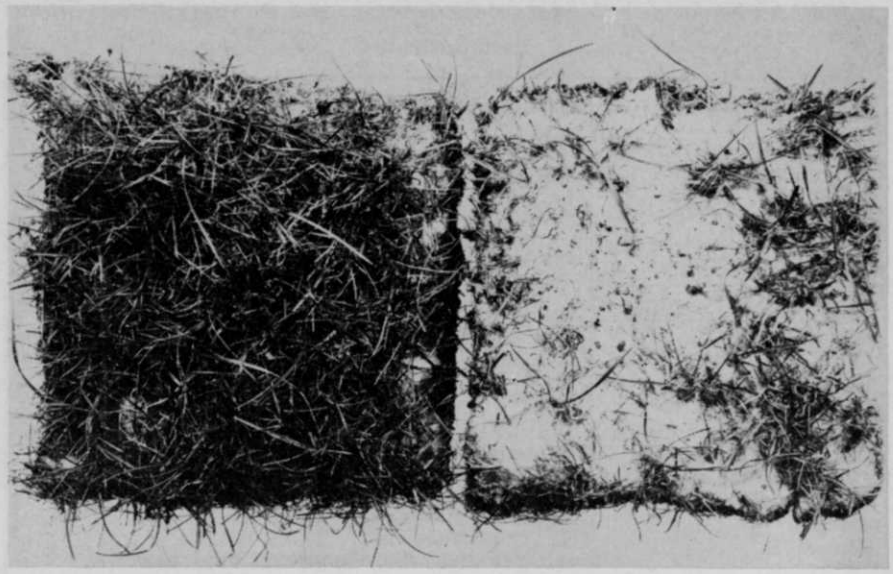
Plant nematodes can be grouped according to the plant area where they feed. There are foliar, seed, and root nematodes. Foliar and seed nematodes travel, under moist conditions, up plant stems and enter flower parts, leaf pores, or stems. Stunting, malformation, and discoloration results from nematode feeding in these areas.

Root nematodes can be divided into two types, ectoparasites and endoparasites. Ectoparasites feed on plant roots from outside the plant. Endoparasites burrow partially or totally into plant roots to feed; these may cause galls, or cysts in roots.

The name "nematode" is derived from Greek and literally means "threadlike." As a group nematodes are also called eelworms or threadworms. Other common names for individual species give the reader some idea about the function of the mouthparts, the way nematodes look in the soil, or the effect of feeding. Some ectoparasitic types are called spiral, sting, dagger, ring, lance, and stubby root nematodes. Others, which burrow to varying depths into roots and plant parts are called root-knot, burrowing, grass-seed, and meadow (lesion) nematodes. The most familiar is the root-knot because the nematode feeding causes roots to swell forming knots which are visible to the naked eye. Several experts advise use of technical names as listed in Tables 1A and 1B since common names vary and can confuse.

Determine Nematode Damage

Nematode damage to turf manifests itself in a generalized way, that is, there is no one symptom that one can chalk up to nematodes. Some authorities disagree on the importance, if any, of nematodes in turf. So far, they say, the proof has been only statistical that a plant may grow better for a while in treated soil versus untreated soil. The long-term effects of nematode predator destruction and making the soil devoid of both destructive and beneficial organisms have not been established, dissenters claim.



Kentucky bluegrass showing response to nematode control by V-C 13. Left treated with 20 gallons per acre; right untreated (after Perry, Darling, and Thorne, 1959).

Control proponents believe that nematodes do have a direct effect on plant vitality, though individual nematodes are much too small to test separately. They also believe that nematode feeding wounds plants and thereby predisposes them to infection by pathogenic soil bacteria, viruses, and fungi. Some nematodes are proven vectors of pathogens. By keeping plants free of wounds, they feel, a healthier "crop" results.

With this disagreement in mind, we can tally what is known so far about the effects nematodes "have been shown" to have on plants.

Symptoms generally include loss of plant vigor, chlorosis (loss of green color), and discoloration in some cases. Roots may be discolored or deformed. Many plants which are drought stressed by lack of moisture show results of nematode feeding. Affected plants show symptoms of nutrient deficiency; sometimes the ailment is indeed a nutrient lack, and sometimes nematode damage simulates this condition. Nematode feeding stunts and deforms new root growth so that nutrients are not absorbed efficiently.

Stems of parasitized grasses may show an obvious shortening between joints. Roots may begin to rot in advanced stages of decline, and sometimes may be covered with lesions or galls as a result of nematode feeding. Some nematode species even affect grass seedheads by feeding in flower parts causing galls to form instead of seed.

Nematode damage can be mistaken for turf ills such as fungus attack, lack of watering, soil compaction, and insect depredation. All these cause similar symptoms. The only way parasitic nematode presence may be determined with accuracy is for an experienced nematologist to analyze a well-prepared soil sample.

Contract applicators can use the process of elimination when diagnosing a suspected case of nematode damage. Many turf ills, such as those mentioned above, can be determined by simple tests and visual inspection. Eliminate the possibility of nutrient deficiency by a soil test for chemical elements. Examine soil to be certain it is not compacted. Culture a tuft of weakened turf with damp filter paper to see if there is any fungus dis-

Table 1A. Nematode Genera, Host Grasses, and Damage Observations
Endoparasites

Nematodes	Some Grasses Affected	Damage Remarks
Cyst Nematodes *Heteroda* spp.	creeping bentgrass Italian ryegrass perennial ryegrass red fescue rough bluegrass St. Augustinegrass	Females encyst in fibrous roots; cysts are visible and tan colored. Established stand contol not now possible.
Root-knot Nematodes *Meloidogyne* spp.	Bermudagrass dallisgrass Kentucky bluegrass St. Augustinegrass	Swellings on both fibrous and lateral roots. Swellings colored same as normal roo' tissue.
Root-lesion Nematodes *Pratylenchus* spp.	bentgrass Bermudagrass centipedegrass crested wheatgrass Kentucky bluegrass St. Augustinegrass tall fescue zoysia	Minute brown lesions visible. These lesions may enlarge and girdle root; this causes pruning. There is little new growth evident.
Burrowing Nematode *Radopholus* sp.	bahiagrass Bermudagrass carpetgrass large crabgrass St. Augustinegrass	Damage similar to root lesion nematode. Root spots become necrotic. Cavities form; girdling and root rot result.
Grass-seed Nematode *Anguina* sp.	bentgrass colonial bentgrass creeping bentgrass redtop velvet bentgrass	Galls are produced in grass flowers. Nematodes inside make purplish galls instead of grass seed.
Leaf-gall Nematodes *Anguina* sp. *Ditylenchus* sp.	colonial bentgrass fescue	Diseased leaves are short, but plants do not lack vigor. Single galls found at leaf bases. These are colored first greenish, then purple, then reddish purple, finally purplish black.

ease present. Search for beetle grubs under the sod. Discuss the history of maintenance with the client since damage can result from improper care. If any of these other troubles are present, they can be corrected before damage is blamed on nematodes. If no other problem is encountered, nematodes are then strong suspects.

Sample Soil to Confirm Diagnosis

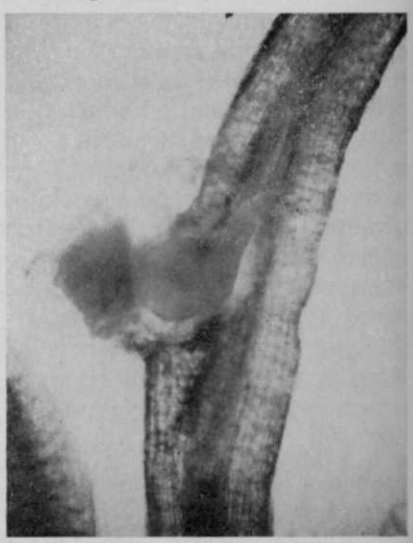
When all factors except nematodes have been considered and eliminated, take a soil sample and send it for analysis to a state extension service or experiment station nematologist with whom a cooperative understanding has been previously arranged.

Soil samples are not difficult to take, but care is needed to get an accurate sampling of overall conditions. With a small trowel take soil from the top six inches under the sod around the border of the affected area. Some diseased plant material may be collected also. Sample the soil in several places and mix the collected samples well. Then remove about a pint and place it into a plastic bag and seal tightly with a rubber band. A pint jar will also work. Avoid drying of the sample. Wrap the sample securely so that postal handling will not damage it. Be certain to label well, and include name, address and what information is desired about the sample. On the label state where the sample was taken, in case anyone wants to find the exact spot again. One can never tell when he will "dig up" an undiscovered species. This information would be very important to a nematologist.

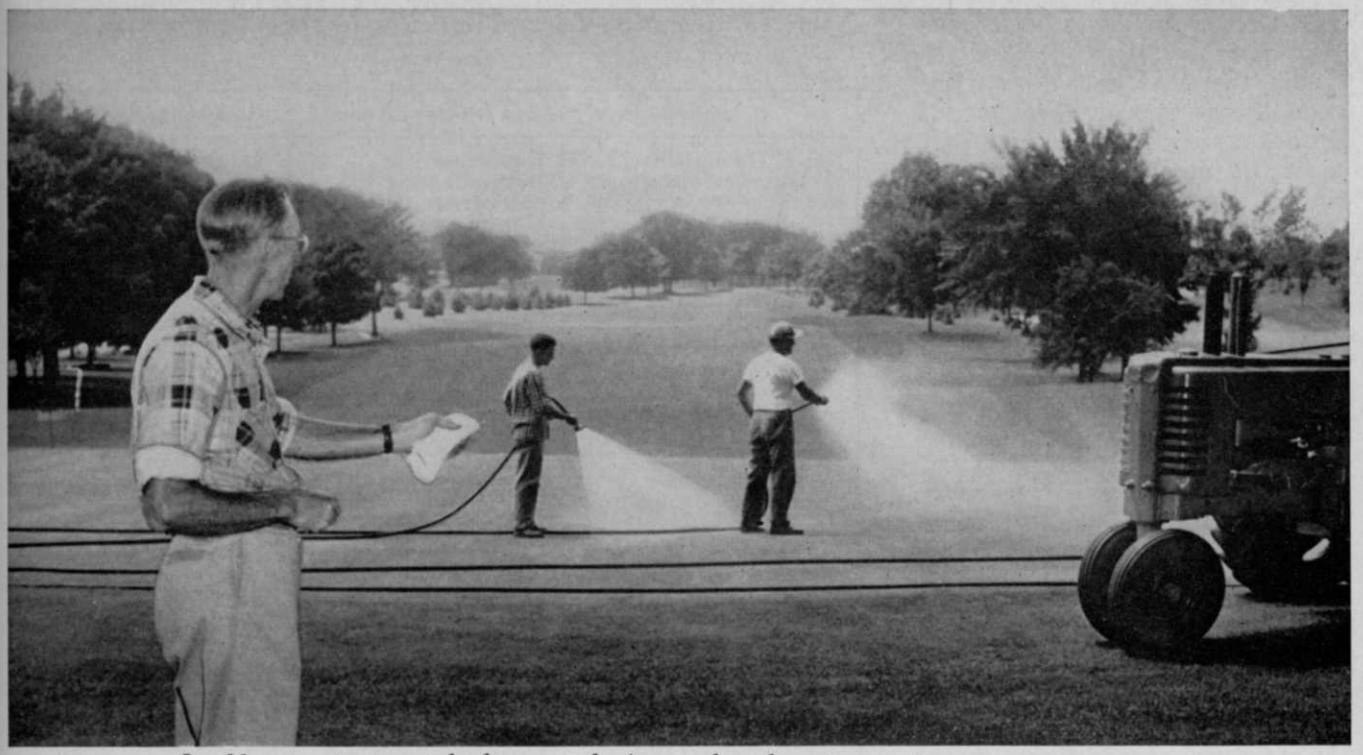
Some CAs who already have their own microscopes may believe they can identify nematodes without sending them away. It is true that one can pick out a soil-inhabiting nematode from other soil organisms with only a little practice, but most soil nematodes are not plant parasitic. There may be an abundance of these wiggling organisms, but if no known pests are among them, one will have to look elsewhere for the cause of damage. An experienced nematologist can pick out the relatively few parasitic genera quickly and accurately.

In one instance, identification of root-knot nematodes, however, the microscope may be helpful and eliminate the need to send samples away for identification. With practice one may be able to observe the galled or knotted roots. Galls may be broken open (this is a delicate task) and examined with a low-power scope to find pear-shaped females. These are hardly visible to the naked eye and look much like small pearls. Galls on most grasses are very small and usually not readily discernible. Experts caution against confusion of any galls with the nitrogen nodules of legume plants such as clovers. These are caused by beneficial bacteria.

If the pearly female nematodes are found along with brownish egg masses which cling to the sides of roots, one can decide in relative safety that the plants are infected with parasitic nematodes, either root-knot, of the genus *Meloidogyne* or cyst, of the genus *Heterodera*. This is



Root-knot nematode imbedded in plant root is shown in this photomicrograph of a nematode gall. (Photo courtesy Shell Chemical Company.)



One Nemagon treatment checks nematodes for months—the entire growing season in many areas.

How to restore nematode infested turf with remarkable new Nemagon® Soil Fumigant

UNHEALTHY turf isn't always a sign of improper fertilization or lack of water. Patchy, "worn-out" greens and tees may be caused by nematodes—microscopic soil pests that feed on and thus shorten or destroy grass roots. Their feeding impairs the plants' ability to take up moisture and minerals from the soil. Weakened plants are susceptible to disease.

Nemagon kills nematodes—not turf

One Nemagon treatment checks nematodes for months—the entire growing season in many areas. And, unlike other soil fumigants, Nemagon does not kill the turf when applied as recommended. On the contrary, now you can *save* turf you once would have destroyed—bring it back to top condition in a few weeks time with a minimum expenditure in time and labor.

Nemagon is easy to apply

You can apply Nemagon with standard spray equipment. Just add Nemagon to a sufficient amount of water to thoroughly drench the area to be treated. The recommended dosage rate is 3 tablespoons of Nemagon Soil Fumigant per 1000 square feet or 5 gallons per acre. In the soil, Nemagon becomes a potent gas that moves laterally and downward, killing nematodes as it spreads.

For more information see your local pesticide dealer, or write: Shell Chemical Company, Agricultural Chemicals Division, 110 West 51 St., New York 20, N.Y.

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sufficient evidence to begin control measures.

For the most part, identification to the species level is not necessary. If one knows that parasitic nematodes are attacking a client's lawn, there is a nematocide or a soil fumigant which will reduce the numbers to a level below that which will be damaging to plants.

In tropical climates nematode damage may be seen all year, but in temperate regions damage is noted mostly from May to November. Nematodes do not usually provoke evident aboveground symptoms while grass is actively growing in spring and late fall. Of course soil temperatures must be about 65 degrees before nematodes hatch and begin feeding, but grass may not show symptoms until placed under stress of summer heat, lack of moisture, or additional wear. Then the absence of a good root system shows because the weakened turf begins to wilt and thin and becomes susceptible to pathological and physiological disorders caused by fungi and bacteria. Tables 1A and 1B show grasses affected by various types of nematodes and general remarks about specific damage observations.

Table 1B. Nematode Genera, Host Grasses, and Damage Observations

Ectoparasites

Nematodes	Some Grasses Affected	Damage Remarks
Spiral Nematodes *Helicotylenchus* spp.	Bentgrass Bermudagrass dallisgrass Kentucky bluegrass ryegrass St. Augustinegrass zoysia	Grass grows well until midsummer when shallow roots prevent absorption of deep water. Nematodes in soil attack most severely in spring; plants revive in late fall.
Sting Nematodes *Belonolaimus* spp.	Bermudagrass centipedegrass Italian ryegrass St. Augustinegrass zoysia	Root lesions restricted to tips where nematodes feed. Malformation of roots evident.
Stylet Nematodes *Tylenchorhynchus* spp.	annual bluegrass bentgrass Bermudagrass centipedegrass crabgrass grama grass Kentucky bluegrass ryegrass zoysia	No lesions evident on roots. Roots shriveled, shortened, and sparsely developed.
Ring Nematodes *Hemicycliophora* spp. *Criconemoides* spp.	Bermudagrass centipedegrass Kentucky bluegrass St. Augustinegrass zoysia	Lesions present at root tips and sides. Root rotting extensive.
Pin Nematodes *Paratylenchus* spp.	grama grass Kentucky bluegrass meadow fescue red fescue ryegrass	Noticeably stunted plant; shortened internodes. Root system larger, but lateral growth lacking proportionately.
Stubby root Nematodes *Trichodorus* spp.	Bermudagrass centipedegrass meadow fescue perennial ryegrass red fescue St. Augustinegrass	Short lateral root branches. Color darker than normal. No distinct lesions or galls.
Dagger Nematode *Xiphinema* sp.	bentgrass Bermudagrass carpetgrass dallisgrass grama grass rough bluegrass St. Augustinegrass zoysia	Chlorotic, sunken, reddish-brown lesions seen on roots. Roots stunted and rotting.
Lance Nematode *Hoplolaimus* sp.	annual bluegrass bentgrass carpetgrass dallisgrass Kentucky bluegrass St. Augustinegrass zoysia	Swelling on roots at feeding zones. Roots turn dark brown. Cortex falls away.

Pre-plant Controls

Two types of control are open to CAs for use against nematodes: pre-plant and post-plant. Pre-plant control involves cultivation, seedbed preparation, and use of one of several fumigant materials. Certain fumigants when properly applied destroy fungi, weeds, grass, and weed and grass seeds, in addition to nematodes. These are useful when one intends to reseed or resod.

Some of the more familiar of these all-purpose soil fumigants are methyl bromide, chloropicrin, Mylone, Vapam, and Vorlex. Labels of some of these fumigants state that tarping is optional, but most experts advise that better results will be obtained with all fumigants if tarps are used. Results are not as dependable, when a water seal is used to contain a drenched fumigant, as the results when a cover is used.

Depending upon the chemical, some labels state that seedbed or sodbed preparation may not be essential, but again experts suggest that good results are more predictable if an area to be fumigated is cultivated and raked before any chemical is applied. There have been cases where undisturbed dead grass serves as a good holding mechanism for new seed, but long-range results are unpredictable at this time.

Mylone, Vapam, chloropicrin, Vidden D, D-D, Telone, ethylene dibromide, dibromochloropropane, and Vorlex may be applied as a drench or rototilled into soil. This application followed by enough water to make an effective seal may do the job.

Methyl bromide is highly toxic and will always require a tarp

(Continued on page 26)

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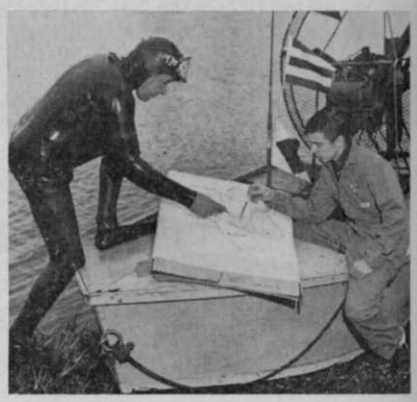

Submerging diver, left, rides diving plane toward lake bottom for look at weed infestation. Pilot George Harris (in airboat) is able to maneuver while towing the diver because the towline is attached to a special hitch in keel of boat under operator's chair. Above, diver Henry Carsner explains what he found to son Jim who is mapping the infestation.

How We Use Scuba Divers In Aquatic Weed Control

BY HENRY CARSNER and RALPH GRENFELL

Northwest Weed Service, Tacoma, Washington

Identification of weed species is prerequisite to the accurate selective control of weeds. This fact is no less true in aquatic weed control.

The problem of making a visual identification of weeds when they are under water is solved with scuba (self-contained underwater breathing apparatus) equipment.

The Northwest Weed Service of Tacoma, Washington, uses such equipment to facilitate before- and after-treatment surveys of weed beds in infested waters.

With a survey map marked out in squares, an experienced diver in a skin-tight suit, foot flippers, face mask, scuba unit, and wrist compass can examine the bottom of a lake to determine the extent of the infestation, and the species and density of the weeds. Colored pencils plot coded information on the survey map to help applicators when they put down the chemical. Marker buoys laid by the diver assist boat drivers to get on the right course.

Aquatic weeds usually grow in individual beds of single species and only in certain marginal zones in a lake. These beds can be accurately determined on the spot using underwater equipment. Beyond marginal zones, any chemical applied to deep, cold water would be of no use. Chemicals applied to known resistant species is likewise valueless.

Some lakes are fed by cold springs. We have found it to be to our advantage to find these pitfalls before chemicals are applied and wasted, swept to the weedless depths by cold currents. Knowledge of hidden facts about underwater conditions helps us bid for contracts with greater accuracy, because we know, for example, where we do not need to apply chemicals to do a complete job, and still make a reasonable profit.

Northwest also uses a diving plane: a flattened, heavy, wing-like, waterproofed, plywood board, which is towed behind our air-drive propeller-driven craft, for faster underwater searches. The plane is efficient for post-treatment examinations where checks are made to see that the job has been complete.

Sometimes weeds which are resistant to the chemical which has been applied will crop up from beds of dead plants. Prompt discovery and identification of such resistant species make later control plans easier.

Northwest Weed Service has found the diving units have paid for themselves many times over, by keeping the applicators informed and prepared.

Typical of modern, custom-designed equipment used by aquatic weed control companies is this barge belonging to Modern Weed Control Service of Grand Rapids, Mich. Owner Vic Scholl is pleased with the Douglas Fir plywood device which is 8 feet long and 2 feet wide.

Double-Duty Herbicide: New ORTHO® Diquat

Kills aquatic weeds like nothing you've ever seen and Diquat is also a terrific non-selective control for weeds around buildings, along fences, ditch banks and roadways.

Quick, and easy to use . . .

Diquat is completely water soluble so that a bare minimum of agitation is all that's required. Because there is no oil residue left behind, cleaning of equipment is greatly reduced. Diquat is absorbed by weeds like a sponge. In a matter of hours weeds collapse and die. (The label directions will tell you how much and when to use.)

Many advantages used as directed . . .

It doesn't build up in water. It is inactivated immediately on contact with soil. Diquat being water soluble eliminates constant citizen complaint of offensive weed oil odors. Diquat is non flammable and non explosive, so it materially reduces fire hazard along highway right-of-ways. Be sure to follow the label directions.

Surprisingly economical . . .

With all these advantages, Diquat is economical, too. That's because it's highly concentrated. A little goes a long way. In fact, five gallons of Diquat will control up to 20 acres of weeds. By comparison it would take up to 2000 gallons of weed oil.

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"The Public Must Be Told" Weedmen Decide At 18th Northeastern Weed Control Conference

In his opening address to more than 750 delegates at the 18th annual Northeastern Weed Control Conference, outgoing president A. J. Tafuro insisted that the entire scope of public relations must be improved and increased in the coming months if the public is to have the real truth about chemical weed control.

Tafuro, who is with American Cynamid in Princeton, N.J., made his opinions about the "PR" function quite plain: "I will suggest to the new executive committee that we put more emphasis on public relations in 1964," the industry authority indicated.

Weed control scientists like the 750-plus representatives of universities, manufacturing firms, and commercial applicators who gathered at the Hotel Astor in New York City Jan. 8-10, should contribute articles to popular and semi-technical magazines, appear on club programs, and otherwise take the true story of weed control with chemicals to the populace at large, Tafuro urged.

Tafuro's remarks preceded a trio of "keynote" addresses which touched on three salient areas of interest to the weed controllers: one renowned highway expert told how and why his state uses chemicals to control weeds; a researcher delivered a highly technical and intriguing report on the use and value of surfactants, and the third offered a compendium of 1963 tests results with promising new compounds.

Roadsides were maintained for many years without herbicides. Why then is it necessary to use herbicides in today's roadside maintenance program? asked Andrew M. Ditton in the conference's initial session.

Ditton is Senior Landscape Architect, New York State Department of Public Works, Albany.

Reason for the ever-increasing need for more efficient control of weeds along rights-of-way is the tremendous highway building boom which had its inception just after World War II.

Of course, the nature of modern highways, including turnpikes and the vast interstate system, dictates that more weed and turf work is needed, simply because of the physical nature of roadways today. Miles of median strips which thread their way across the land mean millions of dollars must be spent to keep them green, neat, and noninterfering with the essential character of the highway system.

The staggering costs of highway mowing is such that supervisors such as Ditton must resort more and more to chemical means for maintaining trimmed grass areas and landscaped embankments.

What will the industry need in the years ahead? Ditton mused. There are three developments which the landscape expert would like to see realized for tomorrow's rights-of-way programs:

1. Herbicides for broadleaf weed control which are nonvolatile and in a form (dry or liquid) that is not subject to drift;

2. Application equipment that will efficiently apply a variety of materials such as granular products as well as liquids; and

3. A growth retardant with a wider range of effectiveness, both as regards plant species and stage of growth.

"Increased emphasis must be placed on the appearance of highway roadsides," Ditton concluded. "We must recognize that the natural beauty of our roadsides is something to be cherished and protected."

Surfactants a Major Aid

"Evolution of plant species has resulted in elaborate variation of the cuticle which in part permits plants to grow in the frigid Arctic and in the blistering desert," according to C. G. McWhorter of the U. S. Department of Agriculture in Stoneville, Miss.

McWhorter co-authored (with Stoneville USDA-man E. E. Schwizer) a paper on the use of surfactants which revealed, in general, that the toxicity of many herbicides is dramatically increased when a surfactant is added to a formulation.

Much of the research at Stoneville has concerned itself with 3,4-dichloropropionanilide (DPA) 2-2-dichloropropionic acid (dalapon), and 3-(3, 4-dichlorophenyl)-1,1-dimethylurea (diuron), the plant physiologist said. In tests with diuron, the addition of surfactants increased herbicidal toxicity and activity with noteworthy results.

"Diuron-surfactant spray mixtures are obviously very phytotoxic when applied postemergence, and these treatments should be economical for weed

Keynoters at the 18th Northeastern Weed Control Conference, the largest in history, included landscape architect A. M. Ditton (below left); Maryland researcher Dr. J. D. Riggelman (below center); and USDA surfactant expert Dr. G. C. McWhorter (below right).

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"ANSAR" 184 **D.S.M.A** for selective control of crabgrass and Dallisgrass in turf.

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control in many situations," the scientist surmised.

An illustrated address which summarized the results of new herbicide tests was presented by Dr. James D. Riggelman, a research assistant with the University of Maryland Vegetable Research Center in Salisbury. There are some exciting new offerings just over the horizon. They include:

- Dicamba, or Banvel-D, a herbicide from Velsicol Chemical Corp. is said to be excellent for brush control. Dicamba is 2-methoxy-3, 6-dichlorobenzoic acid.
- SD7961 is an experimental compound from Shell Chemical. Tests indicate the product is useful for weed control in Bermuda turf. Chemically SD 7961 is 2,6-dichlorothiobenzamide.
- From Thompson-Hayward comes Casoron, 2,6-dichlorobenzonitrile (dichlobenil), a new chemicals found to be useful on ornamentals.
- Dacthal, introduced some time ago by Diamond Alkali. is finding more and more uses, and will now be available in a new formulation which will release the herbicide at a specified rate. Dacthal, dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA) is in wide use as a pre-emergence crabgrass killer.
- One of the most exciting of the new chemicals is Tordon. from The Dow Chemical Co. of Midland, Mich. Tordon has been proved particularly effective for brush control, and is recommended to control cactus in turf and sassafras in cemetaries. Chemically 4-amino-3,5,6-trichloropicolinic acid. Tordon represents a new family of herbicidal compounds.
- Another product of Diamond Alkali is a brush killer made from a new salt of 2,4-D. Known as oleoyl 1. 3-propylene diamine salt, the chemical is said to possess low volatility and high penetrability with the result that many resistant species of brush are more easily killed.
- Azar is a new crabgrass killer from Hercules Powder Company, a chemical from the methylcarbamate group. Azar will soon be available on the open market.

Outgoing prexy A. J. Tafuro was justifiably proud of the current session as he congratulated new NWCC leader, Dr. Robert A. Peters.

An interesting supplement to Riggleman's presentation was the "New Herbicides from Industry" session, now a standard part of the NWCC program. In this portion representatives from various companies are permitted to stand up and tell about new chemicals which the various firms have available.

Of interest to industrial weed controllers is a new water soluble formulation of bromacil, introduced by E. I. duPont de Nemours & Co. in 1961 as "Hyvar." Once this new product is completely dissolved in the spray tank through mechanical or hydraulic agitation, no further agitation of the spray liquid is needed duPont claims.

Representatives of Hooker Chemical Corp. told of Tritac 10G, a formulation of the herbicide Tritac which was introduced last year and which is produced jointly by Hooker and U.S. Borax. The compound is said to control a wide range of annual and perennial broadleaf weeds.

Stauffer Chemical Co. now has Betasan, a selective herbicide for use on turf. Betasan can be applied as a pre-plant, pre-emergence, or postemergnce treatment on Dichondra lawns.

Allied Chemical also has a new product, the experimental herbicide coded as GC-7887, which is in fact hexaflouroacetone trihydrate. It is an effective, nonselective, systemic weed and brush killer, the Allied representative pointed out.

The record turnout of weed control personnel was justified by a program that was startling in its diversity and sheer bulk. Nearly every type of weed control problem received meticulous attention, including such divergent fields as public health weed control, aquatics, weed control in turf, and of course, as always, a most extensive analysis of rights-of-way weed and brush control problems. The scope of the program is too broad to be summarized on these pages, but a complete Proceedings has been publishd and is available, for $3.50, from the group secretary-treasurer, Dr. John A. Meade, Dept. of Agronomy, University of Maryland, College Park.

There were several outstanding presentations of particular significance for the urban/industrial vegetation management personnel who read *Weeds and Turf.*

Use Back-Pack Mistblowers

One such paper was an analysis of the use and effectiveness of the back-pack mist blower for chemical brush control on rights-of-way. The study was conducted by L. C. Kenerson and A. W. Coombs of the Dept. of Forestry, University of Massachusetts, Amherst.

In short, the researchers say the high mobility of the back-pack mistblower, the small amount of spray required to cover large areas, combined with the opportunity to vary the volume applied to suit the kind of brush, make this type of operation very versatile for use on power lines. Use of these devices should be increased in the future, the forestors urged.

Helicopter Use Increasing

Another talk which held delegates' attention was a paper on the use of helicopters for applying herbicides, presented by Charles P. Logg, Jr., vice president of New Jersey Helicopter Airways, Inc.

"The day is coming when aerial applications by the helicopter will overtake its obsolete cousin, the airplane," Logg predicted.

Conference members took time out from their busy educational program to conduct business meetings, attend a banquet, and elect a new president. He is Dr. R. A. Peters of the University of Connecticut. Dr. Meade remains as secretary-treasurer.

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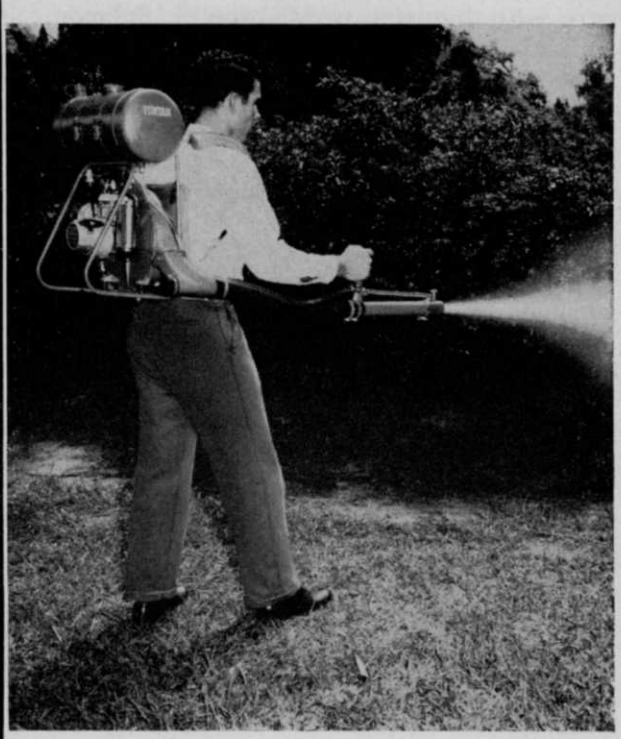

THE R.5 FONTAN FOR HEAVY DUTY WEIGHT 37 LBS.

A self-contained unit, the Fontan has jets to interchange for misting or spraying, another attachment to interchange for dusting. Designed for versatility, dependability and safety, the Fontan has metal frame and padded straps for comfortable operation.

FONTAN + MALATHION = ECONOMY

The Fontan adjusts to allow low-volume spraying with less dilute liquid and a higher concentration of Malathion or other chemical. Both Fontans offer complete portability, choice of droplet size, easy maintenance, safe fuel injection, corrosion-resistant plated parts.

THE R.6 FONTAN FOR SMALLER JOBS WEIGHT 24 LBS.

A torch interchanged with the spray head and nozzle converts either Fontan into a flame thrower for weed killing, snow removal, burning off paint, heating tar for roofs and street repairs, and numerous similar tasks.

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Turf Weeds and Pesticide Tests Top Off Wisconsin Co-op Conference Jan. 8-9

A review session of turf weed control, and insight into the problems of pesticide manufacture from an expert who appeared before the Ribicoff pesticide safety committee hearings, were highlights of the 18th Annual Wisconsin Pesticide Conference with Industry in Madison, January 8-9, at the Park Motor Inn.

The conference is an annual joint venture of the Wisconsin College of Agriculture and Extension Service and the State Department of Agriculture.

"Crabgrass is probably the most serious weed facing Wisconsin homeowners," Robert Newman, extension specialist from the Department of Horticulture, asserted in his talk on "Turf Weed Control." "This pest is the result of poor management, not the cause of poor lawns."

"Once cultural deficiencies, such as low fertility, poor drainage, soil compaction, and improper mowing are corrected, then one can think about applying herbicides to combat the weeds," Newman outlined.

He explained that pre-emergence herbicides have shown the most consistent results for crabgrass control. Tops on the list of recommended materials are Velsicol's Bandane, Stauffer's Betasan, Diamond's Dacthal, and Dow's Zytron. A major concern with pre-emergence control chemicals is their effect on bluegrass which is used extensively for Wisconsin lawns. Other chemicals which will eliminate crabgrass but may injure bluegrass turf are calcium arsenate, and Treflan.

Post-emergence chemicals which are in use include the arsenicals, AMA and DMA, and phenylmercuric acetate, but Newman said, "These have never given us as effective control as the pre-emergence materials."

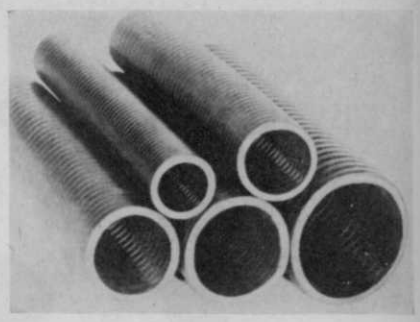
Amines are advised for the control of broadleaved weeds in turf. Silvex amines may damage bentgrass and merion blue, but control broadleaved weeds which 2,4-D will not. Banvel D amine and 2,4,5-T amine are likewise effective systemic herbicides for broadleaved weed control.

Grassy perennials, such as quackgrass and tall fescue, will not withstand spot treatments of dalapon, amitrol, or cacodylic acid. Spot treatments must be made because no effective selective controls have been developed yet. Areas treated with spot grasskillers have to be reseeded or resodded, Newman concluded.

Dr. John P. Frawley, Toxicologist for the Hercules Powder Company, Wilmington, Del., elaborated on his testimony before the Senate Pesticide Committee hearings on the subject of pre-market development screening and testing. Delegates were impressed by the 2 million dollar figure Hercules spends to research a product such as Delnav, their recent insecticide-miticide. "We prefer to utilize outside consultants for various phases of our program," Dr. Frawley told the group as he outlined the research institutes and universities which have done toxicology research work for Hercules.

"A better system [of evaluation] should and will evolve from increased knowledge and understanding of chemical and biological relationships and not from emotionally motivated or politically compromising legislation," Dr. Frawley concluded.

New lawn and garden hose-end sprayer from Chapin Manufacturing Works, Inc., Batavia, New York, has on-the-spot cleaning, without extra tools. Additional refinements include thumb-action on-off water pressure control above pistol grip and 6 gallon wettable powder or liquid insecticide or fungicide jar.



Poly vinyl chloride hose, with a spiral of rigid vinyl, is strong and durable, and will handle all types of material, wet or dry, according to Vinyloy Hose & Tubing Co., Inc., the manufacturer. Available in lengths up to 325 ft., and in sizes 1", 1¼", 1½", and 2" I.D., the hose also comes in two weights, super flexible and heavy duty. Write Vinyloy at 8821 Kenwood Rd., Cincinnati 42, Ohio, for descriptive literature and prices.

Strange Bermudagrass Disease Being Researched at U. of Ark.

A mysterious new turf disease has appeared on Bermudagrass in several southern states and researchers at the University of Arkansas, Fayetteville, have set about to discover its cause, so reports the extension magazine "Arkansas Farm Research" for Nov.-Dec., 1963.

According to Dr. J. L. Dale, associate plant pathologist, and his graduate assistant, Carlos Diaz, the disease, called "spring dead spot" is not like any other turf disease and has been increasing each year in Arkansas.

Each spring affected lawns show larger dead spots than the year before. During the summer runners of healthy grass partially fill in the dead area, but the Bermudagrass does not reestablish itself in the diseased area. Other grasses instead, such as crabgrass and bluegrass fill the spots and do not appear to be affected.

Most Bermudagrass varieties are affected but the U-3 variety is most severely affected. Strangely, the authors report, Bermudagrass which has received better than average care and maintenance is hit hardest and most often.

The cause of this turf condition is not yet known. So far the researchers have discovered that it does not appear to have any connection with pH, fertility, or organic content of the soil, nor do insects or nematodes appear to enter in as a causative factor.

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PRE-EMERGENCE CRABGRASS CONTROL	**CHLORDANE** **BANDANE**	Chlordane provides exceptionally effective pre-emergence crabgrass control, and complete protection against damaging soil insects. Bandane is a newer pre-emergence control, notable for effective control plus safety to seedling grass and established turf. It also kills ants, grubs, and other insects.
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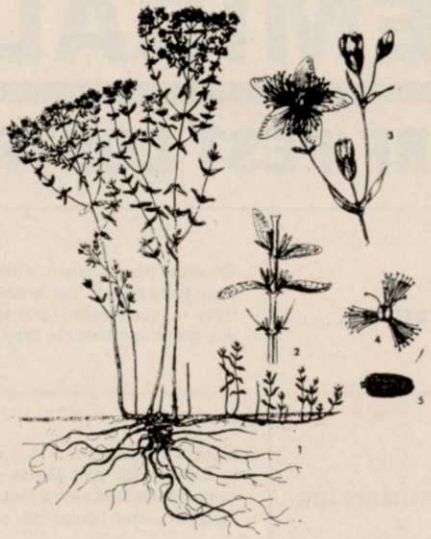
Know Your Species

ST. JOHNSWORT

(Hypericum perforatum)



St. Johnswort (1) is also known as Klamath weed and goatweed. This pest, native to Europe and first reported in Pennsylvania in 1793, is a perennial which reproduces both by seed and by sprouting of shallow, short runners.

It is a poisonous weed to livestock and a threat to productive rangelands. St. Johnswort is found along roadsides, and in fields where the soil is dry, sandy, or gravelly. Found from Newfoundland west to British Columbia, St. Johnswort spreads southward as climate permits. It is a very serious pest in the Pacific Northwest and California, and it is on the noxious weed list of many states.

Stems (2) are erect and may reach a height of 5 feet, and are slender and smooth (not hairy) with two ridges on either side. They are woody near the base, becoming more herbaceous with height.

Leaves, with characteristically translucent dots which give the appearance of perforations when held up to light, are opposite each other on the stem, and narrowly oblong. They sit directly on the stem, have no petiole, and are smooth edged.

Yellow, 5-petaled flowers (3) about 1 inch across bloom in late summer. They are borne at the ends of terminal branches which all reach the same height. This type of flat-topped flower cluster is called a cyme (pronounced sime). Each flower petal has a row of small black dots along its margin. Numerous seeds are produced by each flower (4). Each seed (5) is 1 mm. long with tapered ends and covered with dots. Seeds feel resinous to touch and are glossy dark brown.

Branched roots extend several feet deep. New plants are borne from joints of shallow rootstocks which grow out from the crown.

St. Johnswort has been successfully controlled by leaf eating beetles, *Chrysolina* spp., released in some parts of the West. The leaf beetle, found in Europe and imported to Australia, was later brought from Australia to western U. S. in the 1930s and '40s. Other parasites, including a gall fly, and a root borer, have contributed to a lesser extent to biological control of St. Johnswort.

Chemically, St. Johnswort can be controlled with borax compounds, alone or in combination with other, more powerful soil-applied herbicides. Borax destroys the extensive perennial root system. Ammonium sulfamate has also been used successfully in Washington state to control this weed.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.
(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

Turf Disease Control Improved By New Velsicol Fungicide

A new formulation for turf disease control has been announced by Velsicol Chemical Corp.

Called Velsicol 2-1, the mercuric fungicide is said to overcome several basic handling problems such as getting the fungicide into suspension, maintaining a stable suspension, and avoiding heavy residues of mercury compounds in application equipment.

Excessive foaming is also alleviated by Velsicol 2-1, the producers say.

Brown patch, snow mold, and dollar spot have responded well to the new product, it is reported. Mercury content is at 73.2%.

For more details on the new turf product, write Velsicol Chemical Corp., 341 East Ohio St., Chicago, Ill.

U.S. Borax Acquires Reade's Weed Control Plants, Equipment

U.S. Borax & Chemical Corp. announced recently that it has taken over all herbicide formulating plants and applicating equipment of the Reade Mfg. Co. of Jersey City, N.J.

The action was described as a marketing expansion move into the field of contract application of vegetation control chemicals for railroads.

J. F. Corkill, U.S. Borax Marketing Vice President, said his firm has supplied track spray formulations to some of the country's transcontinental railroads for a number of years from its own plants, and will now be able to render for the first time a complete nationwide service.

Silvex Controls Chickweed

"Chickweed killers containing silvex have given excellent control in North Dakota," Harry Graves, horticulturist at North Dakota State University Extension Service, reports.

"Where chickweed has been present in lawns for a few to several years, several sprayings will be required to kill the thousands of seedlings," Graves concludes.

make a killing with TRITAC™

Profit from this powerful new herbicide for control of bindweed, Canada thistle, Russian knapweed, hoary cress, leafy spurge

Bindweed on May 23, 1963, just before Tritac treatment . . .

looks like this on August 14, 1963. Rate: 15 lb. (7½ gal.)/A.

You can effectively custom-treat an acre for a season or more with as little as four to eight gallons of Tritac.

Used along highways, fence rows and other noncrop land, it controls certain deep-rooted perennial weeds under a wide range of climatic conditions.

When you want quick foliage top kill or want to prevent seeding, use Tritac-D(TM)—the basic formula plus 2,4-dichlorophenoxyacetic acid.

Both Tritac and Tritac-D are noncorrosive and low in toxicity to mammals. The liquid formulation is low in flammability and the granular formulation is nonflammable.

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Hooker sodium chlorate. This original one-shot weed killer is available in steel drums of 50 and 100 lb. net.

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Nematode Control

(from page 14)

or polyethylene plastic cover. Chloropicrin is a tear gas and should be used with caution also.

Before any fumigation, operators should see that the area to be treated receives plenty of water so that all seeds in the soil will be in the process of germination. Fumigants are most effective on growing organisms.

Post-plant Control Methods

Post-plant or established stand control is a newer innovation, not previously possible until the development of specifically nematocidal chemicals which would not kill desirable turfgrasses.

Two chemicals have been developed to control nematodes in mature turf.

The first is V-C 13, chemically known as *O*-2,4-dichlorophenyl *O*,*O*-diethyl phosphorothioate. Virginia-Carolina Chemical Company is the producer.

V-C 13 is a contact nematocide; the manufacturer claims no fumigating action. It is applied as a drench to pre-sprinkled turf at a rate of 1 gallon of 75% active ingredient formulation to 3,000 sq. ft. in 80 gallons of water carrier. For use on bentgrasses, apply ½ gallon to 3,000 sq. ft. Two applications spaced 2 weeks apart are advised for best results. Virginia-Carolina suggests drenching soil with sufficient water to carry the chemical deeper into soil. Action of the nematocide can be expected to give 6 months' control, the manufacturer says.

Normal precautions should be taken with V-C 13, an organophosphorous compound. Use a respirator to avoid breathing mist, and employ a coarse spray to prevent mist formation. If chemical is spilled, wash it off immediately, and do not permit chemical to remain on clothing. One should always wash up after chemical application regardless of whether any chemical has been noticeably spilled.

The second chemical is 1,2-dibromo-3-chloropropane, DBCP, for short. It is marketed by Shell Chemical Company under the trade name "Nemagon," and by The Dow Chemical Company as "Fumazone."

Applicators can dilute 2 pints of 70% emulsifiable concentrate (one of several formulations) in 200 to 300 gallons of water and apply to 1,000 sq. ft. This application will be equal to 5 gallons technical material per acre.

Prior to treatment, it is recommended that the turf be watered and possibly spiked or aerated to aid penetration. Immediately apply enough water to the treated area to wash the nematocide down through the thatch and into the root zone where the nematodes are active.

To work with DBCP, operators should have natural rubber gloves and boots to wear when measuring, transferring, or spraying chemical, because DBCP will cause reddening or irritation of the skin. Manufacturers also suggest applicators do not breathe vapors when mixing and applying; wear an approved respirator to protect both lungs and eyes.

DBCP is only slightly more toxic to man than V-C 13. In all cases, with all products mentioned, the label of the product should be read and studied before any application.

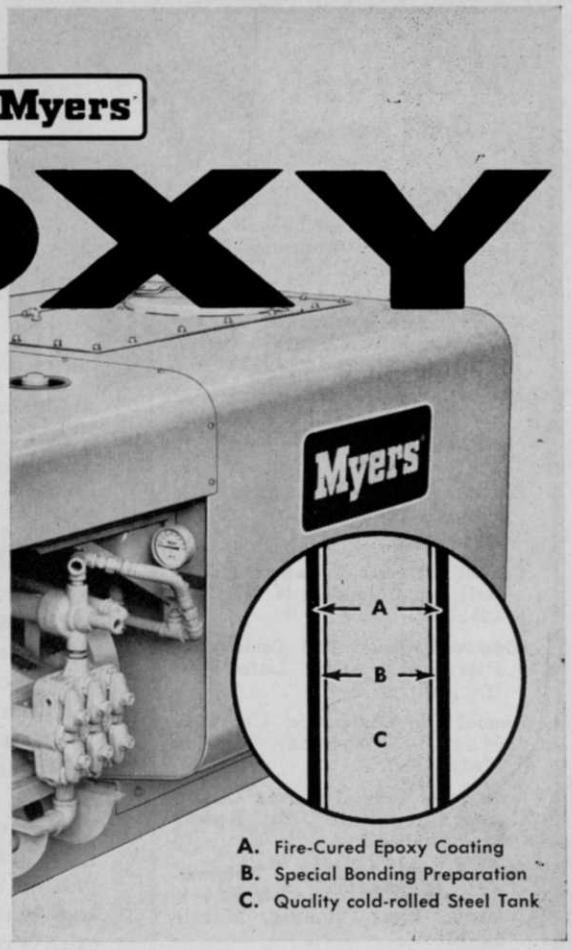
Neither V-C 13 nor DBCP is said to be toxic to turfgrasses when used according to directions. DBCP should not, however, be used within the dripline of desirable plants such as dwarf palm or crysanthemums.

Nematode service by CAs will increase as more homeowners become aware of nematodes, and as more becomes known about the organisms and chemicals for their control. CAs who wish to offer nematode control should engage in a study program using texts, research reports, and promotional and technical literature from manufacturers. Extra knowledge will place the aggressive CA in a more competitive position as the demand for nematode control increases.

Next month:
The Bermudagrass Mite

Mr. Contract Applicator:

YOU SHOULD KNOW ABOUT Myers EPOXY



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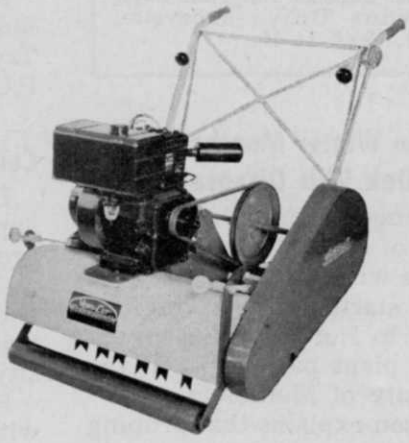

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Compacted soil kills grass. The West Point Landscape Aerifier® scoops out cores of soil in a cultivating action. Turf is loosened in and around the spoon cavity — hard, compaction is eliminated—roots fluorish. "Storage wells" created by spoons allow fertilizer, chemicals, and water to penetrate to root zone.

Verti-cut®

Conventional lawn mowers do not cut lateral grass growth. Thatch and mat develop to harbor disease and prevent water, chemicals, and fertilizer penetration. The vertical cutting blades of the VG-1 West Point Landscape Verti-cut® slice into the turf to remove thatch and excess lateral growth. Set deeper, the Landscape Verti-cut will groove into the soil to remove mat or prepare a seed bed.

Write for more details

West Point Products Corp. **West Point, Pennsylvania**

Meeting Dates

Colorado Aerial and Ground Pesticide Applicator Workshop, Malibu Motor Hotel, Denver, Colo., Feb. 10-11.

Weed Society of America Biennial Meeting, Pick Congress Hotel, Chicago, Ill., Feb. 10-13.

Aquatic Weed Control Society Annual Meeting, Palmer House Hotel, Chicago, Ill., Feb. 11-12.

Southern Turfgrass Conference, Peabody Hotel, Memphis, Tenn., Feb. 24-25.

Cornell Turfgrass Conference, Cornell Univ., Ithaca, N. Y., Feb. 24-27.

Midwest Regional Turf Conference, Purdue Univ., Lafayette, Ind., March 2-4.

Annual Turf Conference, Univ. of Mass., Amherst, Mass., March 5-6.

Iowa State Univ. Turfgrass Conference, Iowa State Univ., Ames, March 10-12.

34th Annual Michigan Turfgrass Conference, Michigan State Univ., East Lansing, March 12-13.

Midwest Regional Turf Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.

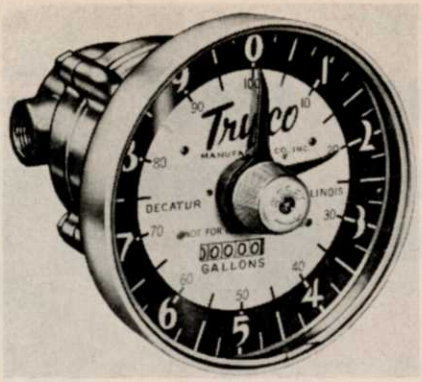
Prune in Winter Months to Avoid Oak Wilt Disease

Pruning in winter avoids the danger of oak wilt disease, since the cuts will be dry by the time growth starts in the spring, according to Herbert Johnson, extension plant pathologist at the University of Minnesota.

Johnson explains that pruning during the growing season is a major cause of new tree infections, as only through a fresh injury may spores infect healthy oaks.

Fungus spores form under the bark of infected trees a few weeks after the trees have died, and push the bark out. Insects then may get to these spore mats through cracks in the bark, and the disease is spread.

Oak wilt fungus can also spread through root grafts, but it can be stopped if roots between infected and healthy trees are cut soon enough.



Reset dial registers to 10 gallons on the large scale of the new, stainless steel flow meter from Tryco Manufacturing Co. Inner dial will measure to 100 gallons, and 5-digit register keeps a running total of the quantity dispensed.

Tryco Offers New Flow Meter

A new stainless steel flow meter said to handle all chemicals and fertilizer solutions, including phosphoric acid, is now being marketed by Tryco Manufacturing Co.

Meter is the first of its type which can withstand the corrosive effects of all liquid fertilizers, according to Tryco, and can be used on all field applicating equipment, including truck sprayers.

Full details on the flow meter, Model MS-8, are available from Tryco Manufacturing Co., Inc., P.O. Box 1277, Decatur, Ill.

Controls Given for Melting-Out

Proper turf management and application of fungicides can provide satisfactory control of melting out, according to L. E. Dickens, extension plant pathologist at Colorado State University, Fort Collins.

Progressive yellowing of grass, with dark-brown or faintly purple leaf spots, is a sign of melting-out disease, Dickens says. Grass crowns turn brown at the soil line, and diseased grass usually dies out in irregular spots which can combine to form large areas of dead grass.

Fungicides that have been effective in controlling melting-out include Acti-dione combinations, Cadmium fungicides, Captan, Dyrene, organic mercury, and Zineb.

Applications should be made during the cool part of the day, Dickens advises, and repeated at 7- to 10-day intervals.

Advertisers

INDEX TO ADVERTISEMENTS

Ansul Chemical Co. 19
John Bean Division, FMC .. 7
Buffalo Turbine Agricultural Equipment Co. .....Jan.
California Chemical Co. Ortho Div. 17
Diamond Alkali Co. 3rd Cover
E. I. duPont de Nemours & Co., Inc. 3
Hardie Sprayers 5
Hedwin Corp. 9
Hooker Chemical Corp. 25
Kemp Manufacturing Co. .. 8
Metalsalts Corp. 26
F. E. Myers & Bro. Co. 27
Niagara Chemical Division, FMC 4
Pennsalt Chemicals Corp. ..30
Robert B. Peters Co., Inc. ..29
B. G. Pratt Co. 29
Prentiss Drug & Chemical Co., Inc. .....Jan.
Shell Chemical Co. 13
Southern Mill Creek Products Co., Inc. 21
Stauffer Chemical Co. .....2nd Cover
Sun Industry, Inc. 29
Tennessee Corp. 6
Union Carbide Corp. 4th Cover
Vandermolen Export Co. .Jan.
Velsicol Chemical Corp. ...23
Virginia-Carolina Chemical Corp. 15
West Point Products Corp. .27

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When answering ads where box number only is given, please address as follows: Box number, c/o Weeds and Turf, 1900 Euclid Avenue, Cleveland, Ohio 44115.

Rates: "Position Wanted" 5c per word, minimum $2.00. All other classifications, 10c per word, minimum $2.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment.

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Labor (at $1.75 per hr.)	$ .88
2-4-D Herbicide	1.63
Total cost for one acre	$2.51

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USDA Approves Zytron for Chinch Bug, Lawn Weed Control

Zytron herbicide, the active ingredient in Dow Crab Grass Killer, has received approval from the U.S. Department of Agriculture for control of 12 additional undesirable plants and chinch bugs.

Current listing of undesirable plants controlled by Zytron includes green and yellow foxtail, crowfoot grass, stinkgrass, barnyard grass, goosegrass, wood sorrel, spurge, purslane, pigweed, smooth or common chickweed, mustard, and lambsquarter. Early spring application is recommended for the control of these species.

For control of chinch bugs the recommended application rate is 7 to 10 lbs. per acre of turf with repeat applications every 60 days, or as needed.

For more information, write Harry L. Patrick, Abbott Road Buildings, The Dow Chemical Co., Midland, Mich.

with Pennsalt
AQUATIC WEED KILLERS

AQUATHOL® controls many species of submerged weeds. Kills weeds on contact . . . can be used in large area or spot treatments. Treated water may be used for watering turf immediately; after 24 hours for swimming; after 7 days for domestic purposes, irrigation, sprays, and livestock.

New AQUATHOL® PLUS controls 25 or more species of emergent and submerged weeds. Kills by contact and systemic action. Leaves water usable for recreation after 24 hours.

HYDROTHOL controls aquatic weeds and algae including Chara. Suggested for use by professional applicators in lakes and ponds . . . either entire or spot treatments.

POTASSIUM ENDOTHAL a special concentrate formulation of endothall designed for the professional contract applicator.

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Bryan, Texas—Montgomery, Alabama

Trimmings

The Hall of Fame. Our good friend David G. Hall, Chief of the Publications Branch, Information Division, Agricultural Research Service in Washington, has been following *Weeds and Turf* with interest, he tells us. This USDA official, who calls himself "an entomologist of sorts," expressed particular intrigue with our article of last September on turf reseeding, written by Dr. Bob Schery of the Lawn Institute. "You may be interested to know," Dave writes, "that I was co-discoverer in 1932 of fine-strain Bermudas. The strain, now known as V-3, was our discovery and I have been following turf problems ever since." Dave's career with the Information Division has been equally notable, and we have often benefited from his good counsel.

* * *

Hello, Colleague! *A Florida sprayman tells us that even though he considers himself a layman as far as journalism goes, he's still laboring each week to prepare a gardening column for his local paper. This budding Hearst is R. A. Hefftner, of Hefftner Power Spraying in St. Petersburg, to whom we say, "a hearty welcome to the Fourth Estate."*

* * *

Adding a Page. James (Jim) Claflin, a vice president of Weed Control Service, Inc. in Portland, Oregon, has announced his firm's acquisition of a new division which will distribute utility company equipment. Operating under the supervision of utility expert Norm Page, the new division will distribute derricks, booms, etc. for the Utility Body Co. of Oakland, Calif. We're always glad to see a company expanding, and wish these west coast industrymen good luck with their new venture.

* * *

Horizons Abroad. *Many experts on the herbicide/insecticide market feel that foreign sales will be increasingly important to American manufacturers in the coming years. One recent crystal-ball-gazer who predicted increased importance of overseas trade was Dr. E. R. Marshall, manager of agricultural chemical sales for Union Carbide International Corp. This bit of information has been circulating around our offices, filling several of our staff with a wistful wanderlust, as they contemplate the necessity for increased editorial coverage of the foreign scene, preferably, the talk goes, by on-the-spot reports.*

* * *

Current Celebration. Speaking of utilities, we just received a beautiful brochure from the Asplundh Companies which commemorates that organization's 35th year serving the utility industry. "Many of our vice presidents," the promotion piece reads, "started with us back in 1928 as climbers and foremen." These same men moved up the ladder as demand for urban/industrial vegetation management increased, so that the Jenkintown, Pa. group feels it has total experience second to none. We salute these pioneer arborists on their 35th year in utility service!

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